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Conflict Resolution and Goal Maintenance Components of Executive Attention are Impaired in Persons With Aphasia: Evidence from the Picture-Word Interference Task

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The exploration of a relationship between attentional impairments and impaired language performance in aphasia has a relatively long history. Engle and Kane (2004), among others, have focused this discussion on executive attention. Others have claimed that executive attention may be a critical component of the cognitive system that subtends some or all language processing impairments in persons with aphasia (PWA) (McNeil, Odell & Tseng, 1991). This study explored this hypothesis by comparing the performance of PWA and normal controls using an interference task to assess Conflict Resolution and Goal Maintenance in a lexical-semantic visual/reading task.

Methods

Goal maintenance and conflict resolution components of executive attention were examined in 20 normal controls and 10 PWA. Words and pictures were presented simultaneously within the Picture-Word Interference (PWI) task. The PWI task consisted of three conditions: congruent, neutral and incongruent. The incongruent trials were delivered in 19% and 73% proportions mixed with the congruent stimuli.

Participants indicated whether the string of letters that appeared on the screen was an animal or non-animal by non-dominant (left) hand key press. Reaction times and Error Rates served as dependent variables.

Results

Conflict Resolution. PWA showed no significant difference in reaction times from the control participants for the congruent condition. However, the PWA showed significantly longer reaction times than the controls in the incongruent condition ($p < .05$).

Goal Maintenance. PWA showed no significant difference in the number of errors between the two incongruent proportions. However, the control participants demonstrated significantly more errors in the 19% than in the 73% incongruent trials ($p < .05$).

DIscussion

Results revealed that the PWA demonstrated impaired conflict resolution as evidenced by longer reaction times on the interference-rich incongruent condition, but not on the non-interference congruent condition compared to the control group. Goal maintenance was impaired in the PWA as evidenced by no difference in the number of errors in

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the incongruent conditions between the 19% and 73% incongruent proportions relative to significant difference in the control group. That is, the control group utilized the incongruent proportion, whereas the PWA were inefficient at maintaining the goal of the PWI task, which resulted in no difference in the number of errors between two incongruent proportions.

The findings from this study support a growing body of evidence identifying executive attentional impairments as a source or consequence of language deficits in PWA. Further experimental work is required to explain how conflict resolution and goal maintenance are linked to more language-specific processing deficits in PWA.

References

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